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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,609	10/03/2006	Keishi Oohashi	NEC 05P015	1581

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EXAMINER	
AHMED, SELIM U	
ART UNIT	**PAPER NUMBER**
2826	
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12/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,609	OOHASHI ET AL.	
	Examiner	Art Unit	
	SELIM AHMED	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) *71* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3, 26, 27, 31, 35, 72, 74, 76-79* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 October 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1-3,26,27,29,31,35,38,41,44,47,50,53,56,59,62,65,68,69,72-79.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10/20/2008, 06/20/2008, 02/20/2008, 12/27/2006, 10/10/2006.

DETAILED ACTION

Election/Restrictions

1. Applicants' response filed on 08/05/2008 regarding election/restrictions sent on 07/03/2008 is acknowledged. It was also acknowledged that applicant elected Group I, claims 1-3, 26-70, 72-79 drawn to photodiode with traverse. The traversal is on the ground, "Claim Group I, as amended no longer includes the technical feature identified". However, special technical feature of the Group I claims "an aperture having a diameter smaller than wavelength of incident light" is still not present in Group II. The special technical feature of the Group II claim "said surface irregularities in said conductive film" is still not present in Group I. So, the special technical feature of Group I is within claim 1 and special technical feature of Group II is within claim 71.

   So, the requirement is still deemed proper and is therefore made **FINAL.**

2. The Preliminary Amendment filed on 08/05/2008 has been entered.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority under PCT/JP2005/06660. The certified copy has been filed on 10/03/2006.

Information Disclosure Statement

4. The Information Disclosure Statements filed on 10/20/2008, 06/20/2008, 02/20/2008, 12/27/2006, 10/10/2006 have been considered.

Oath/Declaration

5. The oath or declaration filed on 10/03/2006 is acceptable.

Claim Objections

6. Claims 68-69 are objected to because of the following informalities:

Claims 68 and 69 are dependent on canceled claims 32 and 33 respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 3, 26, 27, 31, 35 are rejected under 35 U.S.C. 102 (b) as being anticipated by Fujikata ET al (US 2003/0185135; Fujikata hereinafter).

With regard to claim 1, Fujikata discloses a photodiode e.g. Fig. 1 comprising: a conductive film 20 having: an aperture 30 having a diameter smaller than wavelength of incident light (e.g. para[0013, 0014, 0032, claim 15]) and a

periodic structure (e.g. Fig. 2A, element 40, para[0044]) provided around said aperture for producing a resonant state (e.g. para[0010]) by an excited surface plasmon (e.g. para[0010]) in a film surface 40 of said conductive film by means of the incident light to said film surface; and a semiconductor layer 21 provided in a vicinity (e.g. Fig. 1) of said aperture of said conductive film and in contact with said conductive film; wherein said photodiode detects near-field light that is generated at an interface (e.g. para[0041]) between said conductive film and said semiconductor layer by said excited surface plasmon.

With regard to claim 2, e.g. para[0030] of Fujikata discloses the photodiode according to claim 1, wherein said conductive film is a metal film through which said incident light does not pass at locations other than said aperture.

With regard to claim 3, e.g. para[0030] of Fujikata discloses the photodiode according to claim 1, wherein a region in which a Schottky barrier (metal semiconductor contact) formed by said conductive film and said semiconductor layer appears substantially matches a region of generation of said near-field light.

With regard to claim 26, Fujikata inherently discloses the photodiode according to claim 1, wherein a region in which a Schottky barrier formed by said conductive film and said semiconductor layer appears substantially matches a region of generation of said near-field light.

With regard to claim 27, e.g. Fig. 1 of Fujikata discloses the photodiode according to claim 1, wherein said periodic structure is composed of surface irregularities having a period in a direction of increasing distance from said aperture.

With regard to claim 31, e.g. Fig. 1 of Fujikata discloses the photodiode according to claim 1, wherein said periodic structure is composed of concentric grooves that take said aperture as center.

With regard to claim 35, e.g. Fig. 1 of Fujikata discloses the photodiode according to claim 1, wherein said aperture has a bottom surface 20b portion that is a part of said conductive film.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Kasama et al (US 2003/0011722).

With regard to claim 38, Fujikata discloses all of the limitations of claim 1 but does not disclose a scattering member composed of a conductive material for scattering light is arranged in said aperture. However, in Fig. 6, of Kasama discoses a scattering member 603 composed of a conductive material (para[0051]) for scattering light is arranged in said aperture. It would have been obvious to one having ordinary skill in the art at the time of the invention to inclued a scattering member 603 composed of a conductive material for scattering light is arranged in said aperture in order to improve the resolution of the image.

9. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Scruggs et al (US 2004/0151442).

With regard to claim 72, Fujikata discloses all of the limitations of claim 1 including an optical module Fig. 9 comprising: a photodiode 10 according to claim 1 for detecting signal light emitted from an optical fiber 100 to supply it as an electrical signal; but does not disclose a preamplifier for amplifying the electrical signal. However, in Fig.1, element 107 of Scruggs discloses an optical module 100 comprising a preamplifier 107. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a preamplifier as suggested by Scruggs for amplifying electrical signal.

10. Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujikata in view of Scruggs et al (US 2004/0151442) and further in view of Ojima et al (US 6334716).

With regard to claim 74, Fujikata in view of Scruggs disclose all of the limitation of claim 72 with the exception of the optical module comprising: a case; and an optical coupler for optically coupling said optical fiber and said photodiode; wherein said photodiode and said preamplifier are accommodated in said case. However, in Fig. 10, Ojima et al discloses an optical module 10 comprising: a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30. It would have been obvious to one having ordinary skill in the art at the time of the invention to include a case 30; and an optical coupler 43 for optically coupling said optical fiber 42 and said photodiode 31; wherein said photodiode 31 and said preamplifier 32 are accommodated in said case 30 with Fujikata's optical module for predictable results i.e. a complete optical module.

Allowable Subject Matter

4. Claims 29, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 69, 73, 76-79 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With regard to claim 29, the prior art of records fail to teach or suggest a photodiode with particularly a first semiconductive layer of one conductive type and in contact with the second surface of said conductive film; and said photodiode further includes a second semiconductor layer of said one conductive type in which concentration of impurities is higher than in said first semiconductor layer as in the combination of claim 29 and base claim 1.

With regard to claim 76 or 77, the prior art of records fail to teach or suggest an optical interconnect module with particularly a photodiode for receiving incidence of light emitted from a first optical fiber to generate a first signal current; a light source for generating a signal light that is irradiated into a second optical fiber; and a mounting board on which said photodiode and said light source are arranged; wherein said first signal current is supplied to an LSI, and said light source generates the signal light in accordance with the second signal current from said LSI as in the combination of claims 76 or 77 with the base claim.

With regard to claim 41, the prior art of records fail to teach or suggest a photodiode particularly with a scattering member composed of conductive material for scattering light, said scattering member being embedded in said

semiconductor layer side from an interface between said bottom surface portion and said semiconductor layer corresponding to the position of said aperture as in the combination with the base claim.

With regard to claim 44, the prior art of records fail to teach or suggest a photodiode particularly with said aperture penetrates said conductive film and reaches said second semiconductor layer, and of said conductive film, a periphery around said aperture contacts said second semiconductor layer as in the combination with the base claim.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELIM AHMED whose telephone number is (571)270-5025. The examiner can normally be reached on 9:00 AM-6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571)272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SA

/Evan Pert/
Primary Examiner, Art Unit 2826